

BORING LOG FORM

SOIL DESCRIPTION CHECKLIST - FIELD LOG

Guide for Written Soil Description

1. Depth of sample or unit, in feet below ground surface
2. Classification (description and symbol)
3. Color
4. Grain size distribution beginning with most abundant to least abundant constituents (i.e., percentage of fines including plasticity; percentage and size of sand, gravel cobbles, and boulders)
5. Relative density and consistency (condition)
6. Moisture conditions
7. Other relevant information (e.g., structure, laminations, occurrences or organic material)
8. Geologic interpretation (e.g., fill, alluvium)
9. Length of sample recovery/length driven

Example: 5- to 6.5 feet: **SILTY SAND (SM)**, dark gray, 80% fine to medium sand, 15 to 20% non-plastic silt, <5% subrounded fine gravel, very dense, wet. Some leaves, twigs on bedding planes. Sulfur odor. (ALLUVIUM) (14"/18")

Basic Classification

GRAVEL: Gravel Size: Fine = #4 sieve to 3/4"
Medium = 3/4" to 1-1/2"
Coarse = 1-1/2" to 3"

- a. GW, well-graded gravel (2 to 5% fines)
- b. GW-GM or GW-GC, well-graded gravel with silt or clay (5 to 15% fines)
- c. GM or GC, well-graded silty or clayey gravel (>15% fines)
- d. GP, poorly-graded gravel (0 to 5% fines)
- e. GP-GM or GP-GC, poorly-graded gravel with silt or clay (5 to 15% fines)
- f. GM or GC, poorly-graded silty or clayey gravel (>15% fines)

SAND: Sand Size: Fine = #200 (75 μ m) to # 40 (425 μ m) sieve
Medium = # 40 (425 μ m) to #10 (2mm) sieve
Coarse = #10 (2mm) sieve to #4 (4.75 mm) sieve

- a. SW, well-graded sand (2 to 5% fines)
- b. SW-SM or SW-SC, well-graded sand with silt or clay (5 to 15% fines)
- c. SM or SC, well-graded silty or clayey sand (>15% fines)
- d. SP, poorly-graded sand (0 to 5% fines)
- e. SP-SM or SP-SC, poorly-graded sand with silt or clay (5 to 15% fines)
- f. SM or SC, poorly-graded silty or clayey sand (>15% fines)

FINES: Minus #200 Sieve (less than 75 μ m)

- a. ML, inorganic silts, fine sands, clayey silts or sands of low plasticity, or non-plastic
- b. CL, inorganic clays, sandy or silty clays of medium plasticity
- c. OL, inorganic silts or clays of low plasticity
- d. MH, organic silts, micaceous or diatomaceous fine sand or silty soils, elastic silts
- e. CH, organic clays or silts or high plasticity, fat clays
- f. OH, organic clays or silts of low to medium plasticity
- g. PT, peat and other highly organic soils

COBBLES: 3 to 12" diameter, estimate size(s) and percentage

BOULDERS: Greater than 12" diameter, note size(s) and estimate percentage

MINOR ORGANIC CONTENTS: Describe type and occurrence

- a. Wood debris = roots, branches, logs
- b. Organic debris = decaying vegetation

MISCELLANEOUS DESCRIPTIVE TERMS (use with discretion, estimate percentages if possible):

Trace - particles are present but <5%
Few - 5 to 15%
Little - 15 to 25%
Some - 25 to 45%

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F

**MAUL
FOSTER
ALONGI**
ENVIRONMENTAL & ENGINEERING CONSULTANTS

DATE 12/03
DWN. maa
APPR. _____
REVIS. _____
PROJECT NO. 0030.01.02

Figure 2
GLADE ROAD FACILITY
PASCO, WASHINGTON
SOIL DESCRIPTIONS

Procedure for Estimating Plasticity

1. Remove particles larger than the #40 sieve size (greater than fine sand). Select a specimen the size of a 1/2" cube. Mold the specimen to the consistency of putty. If too dry, add water and if sticky, spread it out in a thin layer and allow it to lose some moisture by evaporation. Roll the specimen by hand on a smooth surface, or between the palms, into a thread about 1/8" in diameter. Fold the thread and re-roll repeatedly. This procedure gradually reduces the moisture content and the specimen will stiffen, eventually losing its plasticity. It will crumble at a diameter of 1/8" when near plastic limit.
2. After the thread crumbles, combine the pieces and knead slightly. Continue kneading until the lump crumbles.
3. If the specimen forms a tough thread near the plastic limit and if a lump is stiff when it crumbles, the colloidal clay fraction in the soil is high. Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay or low plasticity.
4. Highly organic clays feel very weak and spongy at the plastic limit.

Criteria for Describing Plasticity

Non-plastic	A 1/8" thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be re-rolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	The specimen can be rolled and kneaded to reach the plastic limit. The thread can be re-rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

Condition

1. Relative density for sand or gravel

- a. Using Standard Penetration Test, blows per foot

<u>Blows/ft (N)</u>	<u>Relative Density</u>
0 - 4	very loose
5 - 10	loose
11 - 30	medium
31 - 50	dense
> 50	very dense

- b. Estimated (no testing)

Loose - sand and/or gravel can be excavated with a shovel

Compact - sand and/or gravel requiring use of a pick for removal

- c. Consistency for fines (note whether blow counts or tactile tests were used)

<u>Blows/ft (N)</u>	<u>Relative Density</u>	<u>Tactile Test</u>
< 2	very soft	sample sags or slumps
2 - 4	soft	sample can be pinched in two
5 - 8	firm	sample easily imprinted to 1" by thumb
9 - 15	stiff	sample readily indented by thumb with pressure
16 - 30	very stiff	sample readily indented by thumbnail
> 30	hard	sample cannot be imprinted w/thumb, can pierce w/pencil

Moisture

1. Dry: contains no water (rarely occurs in nature))
2. Damp: less water than moist
3. Moist: "optimum" water content: a sample squeezes tight and maintains its shape, but you cannot squeeze out excess water
4. Wet: more water than moist

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

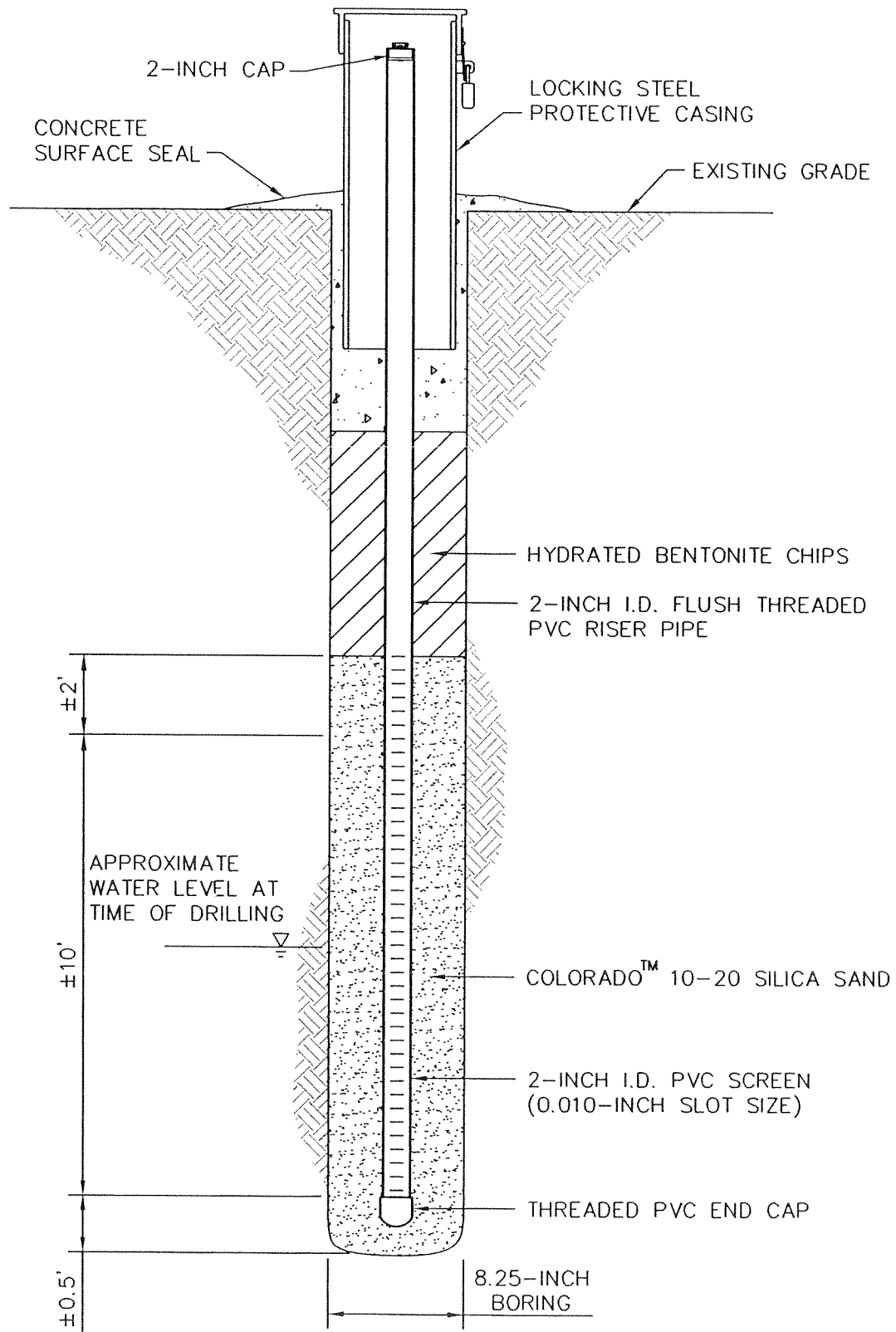
425.744.1489 P
425.744.0919 F

**MAUL
FOSTER
ALONGI**
ENVIRONMENTAL & ENGINEERING CONSULTANTS

DATE 12/03
DWN. maa
APPR. ess
REVIS.
PROJECT NO.
0030.01.02

Figure 2 (continued)
GLADE ROAD FACILITY
PASCO, WASHINGTON

SOIL DESCRIPTIONS



Vancouver:
(360) 694-2691
Edmonds:
(425) 744-1489
Portland:
(971) 544-2139



DATE 12/03
DWN. BDT
APPR. ADS
REVIS.
PROJECT NO.
0030.01.02

Figure 3
GLADE ROAD FACILITY
PASCO, WASHINGTON
GENERALIZED WELL
INSTALLATION DETAILS

Maul Foster & Alongi, Inc.				Excavation Log	
Client				Sheet	of
Project Name				Excavation No.	
Project Number				Date Started	
Engineer/Geologist				Date Finished	
Excavation Contractor				Total Depth	
Method				Ground Elevation	
Depth-to-water in Exc.				Datum	
Sample Number and Number	Sample Interval	FID/ PID Reading (ppm)	Soul Group Symbol (USCS)	Field Location of Excavation:	
				LITHOLOGIC DESCRIPTION	
Excavation Drawing:					

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F



DATE 12/03
DWN. maa
APPR. AOS
REVIS.
PROJECT NO.
0030.02.01

Figure 4
GLADE ROAD FACILITY
PASCO, WASHINGTON

EXCAVATION LOG

Groundwater Field Sampling Data Sheet

Project Name: _____
 Client Name: _____ Sample Location: _____
 Project Number: _____
 Sample Name: _____ Sampler: _____

Hydrology/Level Measurements (Nearest 0.01ft.)

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW	Volume (gallons)	
							1 Pore Vol.:	
							3 Pore Vol.:	

Gallons of Water/Foot for Various Well Diameters

(1" = 0.041 gal/ft) (2" = 0.136 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (10" = 4.080 gal/ft) (12" = 5.875 gal/ft)

Water Quality Data

Vol. #	Purge Method*	Gallons Purged	pH	E Cond (µS/cm)	Temp (°C/°F)	DO (mg/L)	Redox Potential	Water Quality Observations
1								
2								
3								
4								

* Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) PVC/Teflon Bailer (5) Dedicated Bailer (6) Dedicated Pump (7) Other [Specify]: _____

Groundwater Sampling Data

Bottle Type	Date	Time	Method*	Num. @ Vol.	Preservative (Circle)	Filtered (Y/N)
VOA Glass				3 @ 40 ml.	HCL	YES / NO
Amber Glass				@	None/HCL/H ₂ SO ₄	YES / NO
White Poly				@	None	YES / NO
Yellow Poly				@	H ₂ SO ₄	YES / NO
Green Poly				@	NaOH	YES / NO
Red Total Poly				@	HNO ₃	YES / NO
Red Diss. Poly				@	HNO ₃	YES / NO
				@		YES / NO

(Circle if Used)

Total Bottles (Include duplicate count): _____

Duplicate ID: _____

Bottle Type	Typical Analysis Allowed Per Bottle Type (Circle Applicable or Specify Non-Standard Analysis Below)
VOA Glass	(8010) (8010/8020) (8021B) (8020) (8060) (8240) (8260) (BTX) (NWTPH-G _x) (BTX/NWTPH-G _x) OR [] WA []
Amber Glass	(PAH) (TPH-HCID) (TPH-D _x) (TPH-418.1) (Oil & Grease)
White Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (SO ₄) (NO ₃) (NO ₂) (F)
Yellow Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₃ /NO ₂)
Green Poly	(Cyanide)
Red Total Poly	(As) (Sb) (Ba) (Ca) (Cd)(Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (So) (Tl) (V) (Zn) (Hg) (K) (Na)
Red Diss. Poly	(As) (Sb) (Ba) (Ca) (Cd)(Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (So) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness)

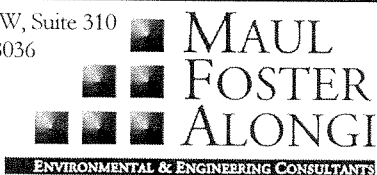
SAMPLER: _____

(Printed Name)

(Signature)

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F



DATE 12/03
 DWN. maa
 APPR. _____
 REVIS. _____
 PROJECT NO. 0030.01.02

Figure 5

GLADE ROAD FACILITY
PASCO, WASHINGTON

GROUNDWATER SAMPLING DATA SHEET

SAMPLING ALTERATION CHECKLIST

Sample program identification: _____

Material to be sampled: _____

Measurement variable: _____

Standard procedure for analysis: _____

Reference:: _____

Variation from standard procedure: _____

Reason for variation: _____

Resultant change in field sample procedure: _____

Special equipment, material, or personnel required: _____

Author's name: _____ Date: _____

Approval: _____ Title: _____

Date: _____

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F



DATE 12/03
DWN. maa
APPR. _____
REVIS. _____
PROJECT NO.
0030.01.02

Figure 6
GLADE ROAD FACILITY
PASCO, WASHINGTON

SAMPLING ALTERATION CHECKLIST

Work Order #:

CLIENT:		INVOICE TO:										TURNAROUND REQUEST in Business Days®									
REPORT TO:		P.O. NUMBER:										Organic & Inorganic Analyses <div> <div>10</div> <div>7</div> <div>5</div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> <div><1</div> </div>									
ADDRESS:												STD. Petroleum Hydrocarbon Analyses <div> <div>5</div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> <div><1</div> </div>									
PHONE:		FAX:		REQUESTED ANALYSES										STD. Please Specify <div> <div>OTHER</div> </div>							
PROJECT NAME:												*Turnaround Request less than standard may incur Rush Charges.									
PROJECT NUMBER:												MATRIX (W, S, O)				# OF CONT.		COMMENTS		NCA WO ID	
SAMPLED BY:		CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME																	
1.																					
2.																					
3.																					
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					
11.																					
12.																					
13.																					
14.																					
15.																					
RELINQUISHED BY:				DATE:				RECEIVED BY:				DATE:									
PRINT NAME:				FIRM:				TIME:				PRINT NAME:				FIRM:					
RELINQUISHED BY:				DATE:				RECEIVED BY:				DATE:									
PRINT NAME:				FIRM:				TIME:				PRINT NAME:				FIRM:					
ADDITIONAL REMARKS:																TEMP:		PAGE		OF	
CUC-RHV-0599																					

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F



DATE 12/03
DWN. maa
APPR. _____
REVIS. _____
PROJECT NO.
0030.01.02

Figure 7
GLADE ROAD FACILITY
PASCO, WASHINGTON

CHAIN OF CUSTODY FORM

Maul Foster Alongi

Page 1 of 1

Client:
Site:
Project No.:
Recorded By:

[illegible]

19401 40th Avenue W, Suite 310
Lynnwood, WA 98036

425.744.1489 P
425.744.0919 F



DATE 12/03
DWN. maa
APPR. _____
REVIS. _____
PROJECT NO.
0030.01.02

Figure 8
GLADE ROAD FACILITY
PASCO, WASHINGTON

PHOTOGRAPH LOG